

AMENDMENTS TO THE CLAIMS:

Please replace the claims with the claims provided in the listing below wherein status, amendments, additions and cancellations are indicated.

1. (Previously Presented) A self-oxidation internal heating steam reforming apparatus constructed so as to conduct self-oxidation of a raw material gas under the presence of oxygen and conduct steam reforming to generate a hydrogen-rich reformed gas, the self-oxidation internal heating steam reforming apparatus comprising:

a steam generator comprising a combustion section for combusting an air-fuel mixture obtained by mixing a combustion air with a fuel, thereby heating water by a combustion gas generated in the combustion section to generate steam;

a first sucking mixer for sucking the raw material gas into a steam stream coming from the steam generator to obtain a raw material-steam mixture; and

a reformer for oxidizing the raw material gas in the raw material-steam mixture by an oxygen-containing gas supplied externally, thereby conducting steam reforming of the raw material gas using a reaction heat of the oxidation to generate a hydrogen-rich reformed gas, wherein:

the reformer comprises a first reaction chamber and a second reaction chamber separated from each other by partition walls, a first portion of said partition

walls being heat-conductive and a second portion of said partition walls being heat-insulating;

the first reaction chamber is provided with a first reaction chamber raw material feed section for supplying the raw material-steam mixture at a first reaction chamber first end, and a first reaction chamber discharge section at a first reaction chamber second end, respectively, while a steam reforming catalyst bed is packed in said first reaction chamber; and

the second reaction chamber is provided with a second reaction chamber raw material feed section communicating with the first reaction chamber discharge section, and a second reaction chamber discharge section, respectively, where the inside of the second reaction chamber is packed with a mixed catalyst bed at a second reaction chamber feed section side, and a shift catalyst bed at a second reaction chamber discharge section side;

said heat-insulating second portion of said partition walls is in contact with the mixed catalyst bed in the second reaction chamber; and

said mixed catalyst bed is prepared by mixing a steam reforming catalyst with an oxidation catalyst.

2. (Previously Presented) The self-oxidation internal heating steam reforming apparatus as in claim 1, wherein a second sucking mixer for sucking the fuel into the combustion air is disposed in order to obtain the air-fuel mixture.

3.(Previously Presented) The self-oxidation internal heating steam reforming apparatus as in claim 1, wherein a CO reducer for oxidizing and reducing carbon monoxide contained in the reformed gas generated in the reformer is disposed.

4. (Previously Presented) The self-oxidation internal heating steam reforming apparatus as in claim 1, comprising a heat exchanger for preheating or heating at least one of the fuel, the raw material gas, or other heating medium using a combustion flue gas discharged from the combustion section.

5. (Previously Presented) The self-oxidation internal heating steam reforming apparatus as in claim 1, further comprising at least one heat exchanger for preheating at least one of the combustion air, the fuel, water for generating steam, the oxygen-containing gas for oxidization, or the raw material-steam mixture using the reformed gas discharged from the reformer.

6. (Previously Presented) The self-oxidation internal heating steam reforming apparatus as in claim 5, wherein said at least one heat exchanger is located to receive a reformed gas conduit at the downstream side of the CO reducer.

7. (Previously Presented) The self-oxidation internal heating steam reforming apparatus as in claim 1, wherein the apparatus is constructed such that, when a

surplus occurs for the steam generated from the steam generator, at least a part of the surplus steam is used to heat other heating medium.

8. (Previously Presented) The self-oxidation internal heating steam reforming apparatus as in claim 7, wherein the apparatus is constructed such that the heating medium is water held in a hot-water tank in which a main hot-water chamber and an auxiliary chamber are vertically communicated with each other, and the surplus steam is supplied to the water in the auxiliary chamber.

9. (Previously Presented) The self-oxidation internal heating steam reforming apparatus as in claim 1, wherein the apparatus is constructed such that the reformed gas is supplied to a fuel cell.

10. (Previously Presented) The self-oxidation internal heating steam reforming apparatus as in claim 9, wherein the apparatus is constructed such that an anode flue gas outflowing from the fuel cell is supplied as a fuel to the combustion section.

11. (Currently Amended) The self-oxidation internal heating steam reforming apparatus as in claim 10, wherein the apparatus comprises: ~~is constructed so as, when a surplus occurs for the steam generated from the steam generator, to comprise:~~ a

mixing section for mixing at least a portion part of the surplus steam generated in the steam generator to the anode flue gas of the fuel cell; a heat exchanger for dewatering a mixture obtained in the mixing section by cooling the mixture using other heating medium to condense moisture; and a heat exchanger for reheating the dewatered mixture using the mixture from the mixing section[[;]], thereby supplying the mixture outflowing from the heat exchanger for reheating as a fuel for the combustion section.

12. (Previously Presented) The self-oxidation internal heating steam reforming apparatus as in claim 1, wherein:

the second reaction chamber is provided with an oxygen-containing gas introduction section communicating with the first reaction chamber discharge section at said first reaction chamber second end; and

the second reaction chamber is provided with a heat-transfer particle bed at a middle section between said mixed catalyst bed and said shift catalyst bed.

13. (Previously Presented) The self-oxidation internal heating steam reforming apparatus as in claim 12, wherein the first reaction chamber is packed with a heat-transfer particle bed at a first reaction chamber raw material feed section side, and a steam reforming catalyst bed at a first reaction chamber discharge section side, while the heat transfer particle bed in the first reaction chamber and the shift catalyst

bed in the second reaction chamber are arranged facing each other via the respective partition walls.

14. (Previously Presented) The self-oxidation internal heating steam reforming apparatus as in claim 1, wherein ends of the partition walls at a first reaction chamber raw material feed section side and a second reaction chamber discharge section side are first fixed ends where the partition walls are joined to each other, respectively, while second ends of the partition walls form free ends where there are no joined ends..

15. (Previously Presented) The self-oxidation internal heating steam reforming apparatus as in claim 12, wherein the reformer, the steam generator, and the first sucking mixer are integrated to form a package structure.

16. (Previously Presented) The self-oxidation internal heating steam reforming apparatus as in claim 15, wherein the package structure further comprises a heat exchanger for preheating the oxygen-containing gas for oxidation supplied to the reformer and/or for preheating the combustion air being supplied to the steam generator.

17. - 23. (Cancelled).

24. (Currently Amended) The self-oxidation internal heating steam reforming apparatus as in claim 27, wherein the apparatus is constructed such that: [[:]]

the second reaction chamber is provided with an oxygen-containing gas introduction section communicating with the first reaction chamber discharge section at said first reaction chamber second end; and

the second reaction chamber is provided with a heat transfer particle bed at a middle section between said mixed catalyst bed and said shift catalyst bed.

25.(Cancelled).

26. (Previously Presented) The self-oxidation internal heating steam reforming apparatus as in claim 1, wherein:

the reformed gas is supplied to a fuel cell; and

the apparatus comprises a recycler for supplying at least a part of an anode flue gas discharged from the fuel cell as the raw material gas.

27. (Previously Presented) The self-oxidation internal heating steam reforming apparatus as in claim 1, wherein:

the reformed gas is supplied to a fuel cell, and an anode flue gas discharged from the fuel cell is supplied as the fuel of the steam generator and/or the raw material gas; and

the shift catalyst bed is disposed with a heat exchanger therein for preheating the anode flue gas discharged from the fuel cell.

28. (Previously Presented) The self-oxidation internal heating steam reforming apparatus as in claim 1, wherein the partition walls have first ends at a first reaction chamber raw material feed section side and a second reaction chamber discharge section side and have second ends, said first ends being fixedly attached to said apparatus and said second ends forming free ends.